

Physiology Unit Test Study Sheet

4.2.1 – 4.2.3 Meiosis

Assessment Statement	Study information
4.2.1 State that meiosis is a reduction division of a diploid nucleus to form haploid nuclei.	<p>Define diploid.</p> <p>What is the diploid # of chromosomes in humans? _____</p> <p>Define haploid.</p> <p>What is the haploid # of chromosomes in humans? _____</p>
4.2.2 Define homologous chromosomes.	<p>Explain homologous chromosomes using a diagram.</p> <p>Explain the difference between homologous chromosomes and sister chromatids. (use a diagram to help)</p>
4.2.3 Outline the process of meiosis, including pairing of homologous chromosomes and crossing over, followed by two divisions, which results in four haploid cells.	<p>Draw a diagram of a cell (whose diploid # is 4 chromosomes) undergoing meiosis. Just show the end result at meiosis I and meiosis II (don't worry about showing every single phase).</p>

6.1 Digestion

Assessment Statement	Study information				
6.1.1 Explain why digestion of large food molecules is essential.	Answer the assessment statement.				
6.1.2 Explain the need for enzymes in digestion.	Compare the rate of digestion at normal body temperature with and without enzymes.				
6.1.3 State the source, substrate, products and optimum pH conditions for one amylase, one protease and one lipase.	Name	Source	Substrate	Products	Optimum pH
	Amylase –				
	Protease –				
	Lipase –				
6.1.4 Draw and label a diagram of the digestive system.	Answer the assessment statement. Be sure to label the mouth, esophagus, stomach, small intestine, large intestine, anus, liver, pancreas and gall bladder. Be sure to show the connections between these organs clearly. You can use boxes, rectangles, etc. to symbolize the organs.				

6.2 The transport system

Assessment Statement	Study Information
6.2.1 Draw and label a diagram of the heart showing the four chambers, associated blood vessels, valves and the route of blood through the heart.	<p>Draw a diagram of the heart. Be sure to label the right and left atria, right and left ventricles, superior and inferior vena cava, aorta, pulmonary artery and vein, semi lunar valves, and atrioventricle valves.</p> <p>Draw arrows showing blood flow through your diagram.</p>
6.2.2 State that the coronary arteries supply heart muscle with oxygen and nutrients.	<p>Explain what could happen if the coronary arteries had a blockage.</p>
6.2.3 Explain the action of the heart in terms of collecting blood, pumping blood, and opening and closing of valves.	<p>Explain blood flow. Be sure to explain the role of the valves as well as the oxygenation state of the blood.</p>
6.2.4 Outline the control of the heartbeat in terms of myogenic muscle contraction, the role of the pacemaker, nerves, the medulla of the brain and epinephrine (adrenaline).	<p>Explain heart contraction (using a diagram if needed). Be sure to label and explain the role of the AV and SA nodes, brain control, atria, ventricles, and adrenaline.</p>

6.2.5 Explain the relationship between the structure and function of arteries, capillaries and veins.

Draw a diagram of a cross section of an artery and explain its function.

Draw a diagram of a cross section of a capillary and explain its function.

Draw a diagram of a cross section of a vein and explain its function.

6.2.6 State that blood is composed of plasma, erythrocytes, leucocytes (phagocytes and lymphocytes) and platelets.

Identify substances commonly found in blood plasma.

Erythrocytes are also known as _____.
What is the function of erythrocytes?

Phagocytic leucocytes are also known as _____.
Explain their function.

Identify the two types of lymphocytes. _____.
Explain the function of both types of lymphocytes.

Explain the function of platelets.

6.2.7 State that the following are transported by the blood: nutrients, oxygen, carbon dioxide, hormones, antibodies, urea and heat.

Substance	Why is it found in blood?	Source of substance	Target organ/cell of substance
Nutrients			

	Oxygen			
	Carbon dioxide			
	Hormones			
	Antibodies			
	Urea			
	Heat			

6.3 Defense against infectious disease

Assessment Statement	Study Information
6.3.1 Define pathogen.	Define pathogen and give 3 specific named examples of pathogens.
6.3.2 Explain why antibiotics are effective against bacteria but not against viruses.	<p>Explain the mechanism of action of one specific antibiotic against a bacteria (a diagram may be helpful).</p> <p>Describe why antibiotics do not target and destroy viruses.</p>
6.3.3 Outline the role of skin and mucous membranes in defence against pathogens.	Outline the role of skin in pathogen defense.

	Outline the role of mucous membranes in pathogen defense.
6.3.4 Outline how phagocytic leucocytes ingest pathogens in the blood and in body tissues.	Using a diagram explain how phagocytic leucocytes ingest pathogens. Be sure to include the process of endocytosis, vesicle formation, and fusion with a lysosome.
6.3.5 Distinguish between antigens and antibodies.	<p>Define and draw a diagram of an antigen.</p> <p>Define and draw a diagram of an antibody.</p> <p>Describe the difference between an antigen and antibody.</p>
6.3.6 Explain antibody production.	Draw a flowchart illustrating the steps necessary for antibody production.

6.3.7 Outline the effects of HIV on the immune system.	Identify the cell type attacked by HIV. _____ Describe how HIV weakens the immune system.
6.3.8 Discuss the cause, transmission and social implications of AIDS.	Identify the pathogen that causes AIDS. _____ How is AIDS transmitted? Identify areas of the world where AIDS is a more serious problem. What are ethical/moral issues that are related to the AIDS epidemic?

6.4 Gas Exchange

Assessment Statement	Study Information
6.4.1 Distinguish between ventilation, gas exchange and cell respiration.	Briefly describe ventilation. Briefly describe gas exchange. Briefly describe cellular respiration.

6.4.2 Explain the need for a ventilation system.	Explain the purpose of the ventilation (respiratory) system.
6.4.3 Describe the features of alveoli that adapt them to gas exchange.	Identify 3 features of alveoli that increase their ability to exchange gases.
6.4.4 Draw and label a diagram of the ventilation system, including trachea, lungs, bronchi, bronchioles and alveoli.	Answer the assessment statement. Remember, you don't have to be an artist!

6.5 Nerves, hormones, and homeostasis

Assessment Statements	Study Information
6.5.1 State that the nervous system consists of the central nervous system (CNS) and peripheral nerves, and is composed of cells called neurons that can carry rapid electrical impulses.	Draw a rough diagram of the nervous system. Label the components of the CNS (brain and spinal cord) and label a few peripheral nerves.

<p>6.5.5 Explain how a nerve impulse passes along a non-myelinated neuron.</p>	<p>Answer the assessment statement. Be sure to include the roles of the voltage gated sodium channel, voltage gated potassium channel, and the sodium/potassium pump.</p>
<p>6.5.6 Explain the principles of synaptic transmission.</p>	<p>Explain the mechanism of neurotransmitter release and degradation (a diagram may be helpful).</p>
<p>6.5.7 State that the endocrine system consists of glands that release hormones that are transported in the blood.</p>	<p>Identify an endocrine gland and identify one hormone released by it.</p>
<p>6.5.8 State that homeostasis involves maintaining the internal environment between limits, including blood pH, carbon dioxide concentration, blood glucose concentration, body temperature and water balance.</p>	<p>Briefly explain how the body maintains carbon dioxide concentrations in the blood at proper levels.</p> <p>Briefly explain how the body maintains proper water balance.</p> <p>Briefly explain how the body maintains blood pH within proper limits.</p>

	<p>Explain type II diabetes.</p> <p>Identify two differences between the two types.</p>
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6.6 Reproduction

Assessment Statement	Study Information
6.6.1 Draw and label diagrams of the adult male and female reproductive systems.	<p>Draw a diagram of the adult male reproductive system. Label the urethra, bladder, prostate gland, cowper’s gland, vas deferens, testes, penis, seminal vesicle, and epididymis.</p> <p>Draw a diagram of the female reproductive system. Label the urethra, bladder, uterus, oviduct, ovary, vagina, and cervix.</p>

6.6.2 Outline the role of hormones in the menstrual cycle, including FSH (follicle stimulating hormone), LH (luteinizing hormone), estrogen and progesterone.

Explain the role of FSH in the menstrual cycle.

Explain the role of LH in the menstrual cycle.

Explain the role of estrogen in the menstrual cycle.

Explain the role of progesterone in the menstrual cycle.

6.6.3 Annotate a graph showing hormone levels in the menstrual cycle, illustrating the relationship between changes in hormone levels and ovulation, menstruation and thickening of the endometrium.

Graph of LH and FSH during the menstrual cycle

Blood concentration

Days

Graph of estrogen and progesterone during the menstrual cycle

Blood concentration

Days

Label ovulation, menstruation, and thickening of endometrium on both graphs.

6.6.4 List three roles of testosterone in males.	Answer the assessment statement.
6.6.5 Outline the process of in vitro fertilization (IVF).	Answer the assessment statement using a flow chart/diagram.
6.6.6 Discuss the ethical issues associated with IVF.	Answer the assessment statement.